

## REMARKS

Claims 1-44 are in the case. The allowability of Claims 31-34, if rewritten in independent form, is noted with sincere appreciation. The novelty of Claims 1-44 is also noted with sincere appreciation.

The amendment to the Specification corrects a clerical error. The format of Claims 29 and 30 has been changed for the purpose of clarity. No additions or deletions to the text of Claims 29 and 30 have been made.

### **Rejections under §112, second paragraph**

#### *1. Rejection of Claim 3*

Claim 3 is rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicants regard as the invention. In particular, the Examiner states that the phrase "mixture of at least two photopolymerizable monomers" "fails to set forth what kinds of photopolymerizable monomers are in the mixture"(Office Action, Page 2).

First, it is clear from the claim language that any two (or more) photopolymerizable monomers can be used when a mixture of photopolymerizable monomers is employed. There are no limitations in Claim 3 on the kinds of photopolymerizable monomers that can be used together when mixtures are employed. Further, in regard to the Examiner's statement that "the kinds of monomer should be clearly set forth" (Office Action, Page 2), it is well settled that claims, and the terms therein, are interpreted in light of the Specification. The term "photopolymerizable monomer" is defined on Pages 8-9 of the Specification to mean acrylate and methacrylate monomers and oligomers (paragraph 0024), and polyfunctional monomers and oligomers, *i.e.*, compounds or oligomers having more than one alpha-beta-ethylenic site of unsaturation (paragraph 0025). Thus it is respectfully submitted that the kinds of monomer are clearly set forth.

As to mixtures of monomers, in paragraph 0026 on Page 9 of the Specification, it is stated that "If desired, alpha,beta-ethylenically unsaturated carboxylic acids can be used in conjunction with acrylate and/or methacrylate monomers." This means that mixtures of the two types of photopolymerizable monomers are contemplated as embodiments of the invention. At Page 8, in the last sentence of paragraph 0024 of the Specification, it is made clear that mixtures of any two or more acrylate or methacrylate monomers and oligomers are included as photopolymerizable monomers. The last sentence of paragraph 0025, on Page 9 of the Specification, states that the polyfunctional monomers and oligomers that can be used as the photopolymerizable monomers include mixtures of any two or more thereof. Thus, the Examiner's statement on Page 2 of the Office Action that "the claims should clearly recite at least two different kinds of photopolymerizable monomers if applicant intends to claim a mixture" is erroneous, because the mixtures of photopolymerizable monomers in the scope of the claims include those in which the at least two photopolymerizable monomers are of the same type.

Therefore, for the foregoing reasons, it is Applicants' position that Claim 3 does particularly point out and distinctly claim the subject matter that Applicants regard as the invention. It is respectfully requested that this rejection be reconsidered and withdrawn.

2. *Rejection of Claim 11*

Claim 11 is rejected under 35 U.S.C. 112, second paragraph as being indefinite for lack of antecedent basis for the word "dodecylmethylanine". Claim 11 has been amended, and no longer recites dodecylmethylanine. Thus, it is submitted that the amendment to Claim 11 renders this rejection moot, and this rejection should be reconsidered and withdrawn.

**Rejections under §103(a)**

1. *Rejection over Henne et al.*

Claims 1-7, 9-22, 34-37, and 38-44(?) are rejected under 35 U.S.C. 103(a) as obvious over Henne et al. (U.S. 4,666,952). This rejection is respectfully traversed.

Henne et al. does not render the presently-claimed invention obvious. The Examiner suggests that the present invention is obvious because careful selection of the groups constituting the formula in Henne et al. yields the tertiary amines of the presently claimed invention. The motivation given on Page 3 of the Office Action by the Examiner for selecting the appropriate groups for the formula in Henne et al., that Henne et al. teaches that "species having long alkyl chains are effective activators," is not found in Henne et al. Selection of certain species from a genus without an indication that the species is desirable in any way is not the standard for obviousness in a genus-species situation. Thus, the rejection is improper at least because there is no motivation to modify the teachings of Henne et al.

Furthermore, the Examiner appear to have misinterpreted the disclosure of Henne et al. in relation to the present invention. At the top of Page 3 of the Office Action, the Examiner stated

When any of  $R^1$ ,  $R^2$ ,  $R^4$ ,  $R^5$  is methyl or ethyl and the group  $-\text{CH}_2-\text{C}(\text{R}_1\text{R}_2)-\text{CH}_2-\text{R}^3$  contains 8 or more carbon atoms wherein  $\text{R}^3$  is an unsubstituted alkyl group, the amines disclosed by Henne et al correspond to the definition set forth in instant claim 1.

Using the preferences disclosed in Henne et al., one would not arrive at the present invention. Henne et al. teaches that  $\text{R}^1$  and  $\text{R}^2$  are preferably alkyl groups, especially methyl groups (column 3, lines 48-51). However, the preferences for  $\text{R}^3$  are pronouncedly different: " $\text{R}^3$  is preferably hydrogen, hydroxyl, an alkoxy group of the type under discussion, or acyloxy, in particular hydroxyl" (column 3, lines 52-54). Alkyl groups are not indicated as being preferred in any way for  $\text{R}^3$ . Thus, following the Examiner's argument that  $\text{R}^1$  and  $\text{R}^2$  are ethyl groups, the maximum number of carbon atoms in the  $-\text{CH}_2-\text{C}(\text{R}^1\text{R}^2)-\text{CH}_2-\text{R}^3$  group is seven, when  $\text{R}^3$  is hydrogen. While more carbon atoms can arguably be present in  $\text{R}^3$ , *e.g.*, when it is an alkoxy group, alkoxy groups are not part of the long chain amines used in the present invention. Thus, there is no motivation or suggestion for one of ordinary skill in the art to select  $\text{R}^3$  to be a long alkyl chain out of the numerous possibilities for  $\text{R}^3$ , particularly when the preferences for  $\text{R}^3$  lie elsewhere.

Therefore, for the foregoing reasons, it is respectfully submitted that this rejection is improper, and it is respectfully requested that this rejection be reconsidered and withdrawn.

2. *Rejection over EP 0 197 616*

Claims 1-11,13-14, 17-18, 20-21, 23-30, and 35-44 are rejected under 35 U.S.C. 103(a) as obvious over EP 0 197 616. This rejection is respectfully traversed.

EP 0 197 616 does not make the presently-claimed invention obvious. The teachings of EP 0 197 616 have been mischaracterized in the Office Action. The formula shown at column 2, lines 45-50 of EP 0 197 616 is identified as prior art (column 2, lines 26-29). There is no suggestion in EP 0 197 616 that the diamines disclosed therein can or should be used in combination with the monoamines of the prior art described therein. In fact, EP 0 197 616 states that the monoamines of the prior art reference are "not suitable for curing thick reinforced substrates by means of visible light" (column 2, lines 20-25). Thus, EP 0 197 616 teaches away from combining the monoamines of the prior art and the diamines disclosed therein and thus also teaches away from the present invention.

Therefore, for the foregoing reasons, it is respectfully submitted that this rejection is improper, and it is respectfully requested that this rejection be reconsidered and withdrawn.

3. *Rejection over Dart et al.*

Claims 1, 3, 5-7, 9, 12-14, 17-18, 21-30, and 35-37 are rejected under 35 U.S.C. 103(a) as obvious over Dart et al. (U.S. 4,071,424). This rejection is respectfully traversed.

The teachings of Dart et al. do not make the presently-claimed invention obvious. Dart et al. does disclose reducing agents including amines containing C<sub>1to10</sub> alkyl groups, a long chain fatty acid amine C<sub>18</sub>H<sub>37</sub>N (CH<sub>3</sub>)<sub>2</sub> (column 5, lines 29-62) and diamines (column 6, lines 1 -49), as the Examiner points out (Office Action, Page 3). However, Dart et al. discloses a very large number of other amines and molecules that can be used as the reducing agent in the systems therein. Dart et al. teaches that the reducing agent may be a primary, secondary or tertiary amine or phosphine (column 5, lines 3-16 and 39-49). In sharp contrast, the present invention is not at all concerned with phosphines, and contemplates only tertiary amines, not primary or secondary amines. Unsaturated amines, including aromatic amines, are also disclosed in Dart et al. (column

5, lines 3-16 and 60-62), while the present invention is directed to alkyl amines. Turning now to diamines, those diamines disclosed in Dart et al. can have hydrogen atoms bonded directly to the nitrogen atoms (column 6, lines 15-28 and 39-44), and also include unsaturated diamines (column 6, lines 50-59). In the present invention, the diamines are fully tertiary; that is, there are no hydrogen atoms bonded directly to the nitrogen atoms of the diamines, and the diamines used in the present invention have alkyl groups, not unsaturated groups. The only preference indicated in Dart et al. regarding the reducing agent is in the discussion of the formula  $R_3M$ , where M can be nitrogen, phosphorous, arsenic, or antimony, and a preference for M to be nitrogen is indicated (column 5, lines 30-37). Selection of certain species from a genus without an indication that the species is desirable in any way is not the standard for obviousness in a genus-species situation, especially when such a large genus is presented in the reference.

Other than the preference for nitrogen (column 5, lines 36-37), there is no indication of preferences in Dart et al. Looking to the Examples therein for further guidance, several nitrogen-containing compounds were tested:

Example 1: dimethylaminoethyl methacrylate, n-butylamine, di-n-butylamine, triethylamine, tri-n-butylphosphine, allylthiourea, S-benzyl iso-thiuronium p-toluene sulphinate;

Example 5:  $XHNCONHX$ , where X has the structure  $-CH_2OCH_2CH_2OCOC(CH_3)=CH_2$ ;

Example 14: o-tolyl thiourea and sodium diethyl dithiophosphate; and

Example 18: N,N-dimethyl aniline and N-methyl diphenylamine.

The remaining Examples in Dart et al. use the above-listed reducing agents, especially dimethylaminoethyl methacrylate. A perusal of the above list shows that the amines used in the Examples of Dart et al. would not have led one of ordinary skill in the art to the present invention, which involves alkyl tertiary amines and alkyl tertiary diamines, from the above list of reducing agents or from any other part of the disclosure of Dart et al.

Therefore, for the foregoing reasons, Applicants submit that a *prima facie* case of obviousness has not been established, and it is respectfully requested that this rejection be reconsidered and withdrawn.

In view of the above amendments and comments, it is believed that on reconsideration the claims should be allowed. Notification to the effect would be appreciated.

If any matters remain in requiring further consideration, the Examiner is respectfully requested to telephone the undersigned so that such matters can be discussed, and if possible, promptly resolved.

Please continue to address all correspondence in this Application to Mr. Edgar E. Spielman, Jr. at the address of record.

Respectfully submitted,

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